

WHAT IS CLAIMED IS:

1. A waveform equalizer comprising:

an equalizing filter unit including a delay circuit with a tap;

5 a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

10 a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart a starting step of equalizing steps for equalizing a reception signal, depending upon a change state of the tap coefficient used while the reception signal is equalized.

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2. A waveform equalizer equipped comprising:

an equalizing filter unit including a delay circuit with a tap;

20 a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

25 a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart reception signal equalizing steps from a preselected step prior

to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal.

5 3. A waveform equalizer equipped comprising:
 an equalizing filter unit including a delay circuit with
 a tap;

 a discriminator which decodes an output signal of said
 equalizing filter unit;

10 tap arrangement control means which controls a tap arrangement
 of said equalizing filter unit;

 a tap coefficient monitoring unit which monitors a tap
 coefficient of said equalizing filter unit, and changes the tap
 arrangement of said equalizing filter unit so as to restart
15 reception signal equalizing steps from a preselected step prior
 to the present step thereof while said reception signal is equalized,
 depending upon a change state of the tap coefficient during the
 equalization of said reception signal, and further so as to
 repeatedly perform said operation, depending upon a change
20 condition of the tap coefficient while restarting the equalization
 of said reception signal.

 4. A waveform equalizer as claimed in any one of the
 preceding claims 1, 2, and 3, wherein said tap coefficient
25 monitoring unit monitors only a specific tap, and when a sharp
 change in a tap coefficient of said specific tap is detected,

said tap coefficient monitoring unit instructs that the tap arrangement of said equalizing filter unit is changed so as to restart the equalization of the reception signal.

5 5. A waveform equalizer as claimed in any one of the preceding claims 1, 2, and 3, wherein said tap coefficient monitoring unit monitors only a specific tap, and when dispersion of a change amount of said tap coefficient exceeds a certain threshold value, said tap coefficient monitoring unit instructs
10 that the tap arrangement of said equalizing filter unit is changed so as to restart the equalization of the reception signal.

6. A waveform equalizer as claimed in any one of the preceding claims 1, 2 and 3, wherein said tap arrangement control
15 means further comprising an impulse response predicting device for predicting an impulse response of a transfer path; and

wherein said tap arrangement control means changes the tap arrangement of said equalizing filter unit in such a manner that said tap arrangement becomes suitable for the next impulse having
20 a large pulse component in response to an impulse response predicted by a reference signal.

7. A waveform equalizer as claimed in any one of the preceding claims 1, 2 and 3, wherein said tap arrangement control
25 means comprising an impulse response predicting device for predicting an impulse response of a transfer path; and

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wherein said tap arrangement control means changes the tap arrangement of said equalizing filter unit in such a manner that said tap arrangement becomes optimum with respect to an impulse response predicted by both the equalized output of said discriminator and a condition of the reception signal.

8. A mobile station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

10 an equalizing filter unit including a delay circuit with a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

15 tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart a starting step of equalizing steps for equalizing a reception signal, depending upon a change state of the tap coefficient used while the reception signal is equalized.

9. A mobile station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

25 an equalizing filter unit including a delay circuit with

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a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement
5 of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart reception signal equalizing steps from a preselected step prior
10 to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal.

10. A mobile station wireless apparatus equipped with a
15 waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

an equalizing filter unit including a delay circuit with
a tap;

a discriminator which decodes an output signal of said
20 equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap
25 arrangement of said equalizing filter unit so as to restart reception signal equalizing steps from a preselected step prior

to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal; and further so as to repeatedly perform said operation, depending upon a change
5 condition of the tap coefficient while restarting the equalization of said reception signal.

11. A mobile station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused
10 by frequency selective fading, said waveform equalizer comprising:
an equalizing filter unit including a delay circuit with a tap;
a discriminator which decodes an output signal of said equalizing filter unit;
15 tap arrangement control means which controls a tap arrangement of said equalizing filter unit;
a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit; and
detector means which detects a moving speed of the mobile
20 station wireless apparatus,
wherein when the moving speed is higher than a preselected threshold value, the tap arrangement of said equalizing filter unit is changed so as to restart a starting step of equalizing steps for equalizing a reception signal, depending upon a change
25 state of the tap coefficient used while the reception signal is equalized.

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12. A mobile station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

5 an equalizing filter unit including a delay circuit with a tap;

 a discriminator which decodes an output signal of said equalizing filter unit;

 tap arrangement control means which controls a tap arrangement
10 of said equalizing filter unit;

 a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit; and

 detector means which detects a moving speed of the mobile station wireless apparatus,

15 wherein when the moving speed is higher than a preselected threshold value, the tap arrangement of said equalizing filter unit is changed so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change
20 state of the tap coefficient during the equalization of said reception signal.

13. A mobile station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

25 an equalizing filter unit including a delay circuit with

a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement
5 of said equalizing filter unit;

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit; and

detector means which detects a moving speed of the mobile station wireless apparatus,

10 wherein when the moving speed is higher than a preselected threshold value, the tap arrangement of said equalizing filter unit is changed so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change
15 state of the tap coefficient during the equalization of said reception signal; and further so as to repeatedly perform said operation, depending upon a change condition of the tap coefficient while restarting the equalization of said reception signal.

20 14. A base station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

an equalizing filter unit including a delay circuit with
a tap;

25 a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart a starting step of equalizing steps for equalizing a reception signal, depending upon a change state of the tap coefficient used while the reception signal is equalized.

10 15. A base station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

an equalizing filter unit including a delay circuit with a tap;

15 a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal.

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16. A base station wireless apparatus equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

an equalizing filter unit including a delay circuit with
5 a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

10 a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized,
15 depending upon a change state of the tap coefficient during the equalization of said reception signal; and further so as to repeatedly perform said operation, depending upon a change condition of the tap coefficient while restarting the equalization of said reception signal.

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17. A mobile communication system having a base station and a mobile station, in which at least one of said base station and said mobile station is equipped with a waveform equalizer capable of removing an adverse influence caused by frequency
25 selective fading, said waveform equalizer comprising:

an equalizing filter unit including a delay circuit with

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a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement
5 of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart a starting step of equalizing steps for equalizing a reception
10 signal, depending upon a change state of the tap coefficient used while the reception signal is equalized.

18. A mobile communication system having a base station and a mobile station, in which at least one of said base station
15 and said mobile station is equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

an equalizing filter unit including a delay circuit having
a tap;

20 a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

a tap coefficient monitoring unit which monitors a tap
25 coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart

reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal.

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19. A mobile communication system having a base station and a mobile station, in which at least one of said base station and said mobile station is equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

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an equalizing filter unit including a delay circuit with a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

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tap arrangement control means which controls a tap arrangement of said equalizing filter unit; and

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a tap coefficient monitoring unit for monitoring a tap coefficient of said equalizing filter unit, and changes the tap arrangement of said equalizing filter unit so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal; and further so as to repeatedly perform said operation, depending upon a change condition of the tap coefficient while restarting the equalization of said reception signal.

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20. A mobile communication system having a base station and a mobile station, in which said mobile station is equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer
5 comprising:

an equalizing filter unit including a delay circuit with a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

10 tap arrangement control means which controls a tap arrangement of said equalizing filter unit;

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit; and

15 detector means which detects a moving speed of the mobile station wireless apparatus,

wherein when the moving speed is higher than a preselected threshold value, the tap arrangement of said equalizing filter unit is changed so as to restart a starting step of equalizing steps for equalizing a reception signal, depending upon a change
20 state of the tap coefficient used while the reception signal is equalized.

21. A mobile communication system having a base station and a mobile station, in which said mobile station is equipped
25 with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer

comprising:

an equalizing filter unit including a delay circuit with a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit;

a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit; and

10 detector means which detects a moving speed of the mobile station wireless apparatus,

wherein when the moving speed is higher than a preselected threshold value, the tap arrangement of said equalizing filter unit is changed so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said reception signal.

20 22. A mobile communication system having a base station and a mobile station, in which said mobile station is equipped with a waveform equalizer capable of removing an adverse influence caused by frequency selective fading, said waveform equalizer comprising:

25 an equalizing filter unit including a delay circuit with a tap;

a discriminator which decodes an output signal of said equalizing filter unit;

tap arrangement control means which controls a tap arrangement of said equalizing filter unit;

5 a tap coefficient monitoring unit which monitors a tap coefficient of said equalizing filter unit; and

detector means which detects a moving speed of the mobile station wireless apparatus,

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10 wherein when the moving speed is higher than a preselected threshold value, the tap arrangement of said equalizing filter unit is changed so as to restart reception signal equalizing steps from a preselected step prior to the present step thereof while said reception signal is equalized, depending upon a change state of the tap coefficient during the equalization of said
15 reception signal; and further so as to repeatedly perform said operation, depending upon a change condition of the tap coefficient while restarting the equalization of said reception signal.